

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. **(Currently Amended)** An apparatus for detecting vulnerable plaque within a lumen defined by an intraluminal wall, the apparatus comprising:  
  
a probe that resiliently assumes a preferred shape, the probe having  
  
an optical fiber extending therethrough, and  
  
an atraumatic light-coupler in ~~[contact with]~~ optical communication with the optical fiber, the coupler being disposed ~~[configured]~~ to atraumatically contact the intraluminal wall when the probe resiliently assumes the preferred shape ~~[at a point at which light exits the atraumatic light coupler and enters the wall];~~  
  
a light source in optical communication with the fiber for illuminating the wall; and  
  
a detector in optical communication with the fiber for detecting light from within the wall.
2. **(Previously presented)** The apparatus of claim 1, wherein the probe further comprises a jacket enclosing the fiber.
3. **(Previously presented)** The apparatus of claim 2, wherein the jacket comprises a coil-wire wound into a coil-wire jacket.

4. **(Previously presented)** The apparatus of claim 3, wherein the jacket comprises a coil wire having a variable diameter.
5. **(Previously presented)** The apparatus of claim 1, wherein the probe comprises a plurality of optical fibers.
6. **(Cancelled)**
7. **(Currently Amended)** The apparatus of claim 1 [6], wherein the preferred shape comprises a bow.
8. **(Currently Amended)** The apparatus of claim 1 [6], wherein the preferred shape comprises an arc.
9. **(Currently Amended)** The apparatus of claim 1 [6], wherein the preferred shape comprises a portion of a catenary curve.
10. **(Previously presented)** The apparatus of claim 1, wherein the atraumatic coupler is disposed at a distal tip of the probe.
11. **(Previously presented)** The apparatus of claim 10, wherein the atraumatic coupler comprises a lens attached to the distal tip of the optical fiber.
12. **(Previously presented)** The apparatus of claim 10, wherein the atraumatic coupler is integral with the optical fiber.
13. **(Previously presented)** The apparatus of claim 12, wherein the atraumatic coupler comprises a distal tip of the optical fiber.
- 14-19. **(Cancelled)**
20. **(Previously presented)** The apparatus of claim 1, wherein the light source comprises a near infrared light source.

21. **(Previously presented)** The apparatus of claim 1, further comprising a processor in data communication with the detector, the processor being configured to identify a vulnerable plaque on the basis of a signal provided by the detector.

22-42. **(Cancelled)**

43. **(Original)** A method of detecting vulnerable plaque within an intraluminal wall, the method comprising:

placing an atraumatic light coupler in contact with the intraluminal wall;

passing light through the intraluminal wall by way of the atraumatic light coupler;

receiving light from within the intraluminal wall by way of the atraumatic coupler; and

providing the received light to a processor for analysis to identify the presence of a vulnerable plaque.

44. **(Original)** The method of claim 43, wherein placing an atraumatic light coupler in contact with the intraluminal wall comprises placing a distal end of a probe in contact with the intraluminal wall.

45. **(Cancelled)**

46. **(Currently Amended)** An apparatus for detecting vulnerable plaque within a lumen defined by an intraluminal wall, the apparatus comprising:

a probe that resiliently assumes a preferred shape, the probe having

an optical fiber extending therethrough, and

means for atraumatically contacting the intraluminal wall, the contacting means being in

~~[contact]~~ optical communication with the optical fiber and ~~[including means for~~

~~providing optical communication with]~~ being disposed to contact the intraluminal wall when the probe assumes the preferred shape;

a light source in optical communication with the fiber for illuminating the wall; and

a detector in optical communication with the fiber for detecting light from within the wall.

47. **(Previously presented)** The apparatus of claim 46, wherein the means for atraumatically contacting the intraluminal wall comprises a rounded surface at a distal tip of the probe.
48. **(Previously presented)** The apparatus of claim 47, wherein the rounded surface comprises a surface of a lens attached to the fiber.
49. **(Previously presented)** The apparatus of claim 48, wherein the means for providing optical communication comprises the lens.
50. **(Previously presented)** The apparatus of claim 47, wherein the rounded surface comprises a surface of the fiber.
51. **(Previously Presented)** The apparatus of claim 46, wherein the means for providing optical communication comprises the fiber.
52. **(Cancelled)**
53. **(Previously presented)** The apparatus of claim 52, wherein the means for providing optical communication comprises a reflective surface in optical communication with the side-window and with a face of the fiber.
54. **(Previously presented)** The apparatus of claim 52, wherein the means for providing optical communication comprises an angled face of the fiber.

- 55. (Previously presented) The apparatus of claim 52, wherein the means for providing optical communication comprises a diffraction grating in optical communication with the side-window and with the fiber.
- 56. (New) The apparatus of claim 1, wherein the atraumatic light-coupler is in contact with the optical fiber.
- 57. (New) The apparatus of claim 1, wherein a surface of the atraumatic light coupler is in contact with the optical fiber.
- 58. (New) The apparatus of claim 1, wherein the atraumatic light-coupler is disposed at a distal tip of the probe.
- 59. (New) The apparatus of claim 1, wherein the atraumatic light coupler is disposed along a side of the probe.
- 60. (New) The apparatus of claim 1, wherein the atraumatic light coupler contacts the wall at a point at which light exits the atraumatic light-coupler and enters the wall.
- 61. (New) The apparatus of claim 1,  
  
wherein the atraumatic light coupler contacts the wall at a point at which light exits the atraumatic light-coupler and enters the wall, and  
  
wherein a surface of the atraumatic light coupler is in contact with the optical fiber.